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# Environmental Assessment

## Bean North Vegetation Project

Seward Ranger District, Chugach National Forest





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# Chapter 1 – Purpose and Need

## Document Structure

The U.S. Forest Service has prepared this Environmental Assessment (EA) in compliance with the Healthy Forest Restoration Act (HFRA), the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This EA discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

- **Purpose and Need:** This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Chugach National Forest (Forest) informed the public of the proposal and how the public responded.
- **Alternatives:** This section provides a more detailed description of the agency's proposed action for achieving the stated purpose. The action alternative was developed based on non-key issues raised by the public and other agencies during the scoping period. This discussion also includes project design criteria to minimize or eliminate resource impacts from project implementation.
- **Environmental Consequences:** This section describes the environmental effects of implementing the Proposed Action and the No Action alternative. This analysis is organized by resource area. Within each section the effects of the No Action Alternative and the Proposed Action Alternative are evaluated and compared.
- **Consultation and Coordination:** This section provides a list of preparers and agencies consulted during the development of the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Seward Ranger District Office in Seward, Alaska.

## Purpose and Need

The purpose of this project is fire prevention and protection, hazardous fuels reduction, and wildlife habitat and vegetation enhancement, while protecting recreational values.

The Chugach National Forest and the State of Alaska have been working in the Juneau Creek and Cooper Landing area to reduce fuels related to the spruce bark beetle and improve wildlife habitat since the early 1970s, often achieving both objectives with one entry. The Bean North project will spatially continue the treatment of hazardous fuels in the area, creating a fairly continuous treated area northwest of Cooper Landing and north of the Sterling Highway. The project area is within the Cooper Landing Wildland Urban Interface (WUI) of the Kenai Peninsula Borough. A Community Wildfire Protection Plan (CWPP) has been developed to address the hazardous fuels in the Cooper Landing WUI. A need exists to create defensible space for more effective fire suppression and to reduce the probability of rapid fire spread by minimizing surface and ladder fuels, removing dead and dying trees, and thinning stands of trees. These treatments are important to protect the community and its infrastructure from wildfire.

A need also exists to enhance wildlife habitat to create browse for moose in their winter range. The Bean North project aims to promote young birch, willow, and aspen within moose winter range. Browse availability in moose winter range is very important to winter survival and maintaining healthy populations. Treatments promote browse for a limited time, often 20-30 years once hardwoods are established, before the trees and new shoots get out of reach. The time period browse is available after treatment is variable and dependant on site conditions and the type of treatment. Implementing treatments over space and time help to provide a continuous

supply of food in addition to what becomes available naturally after avalanches, flooding, and fire. This project works in concert with recent habitat improvement projects to maintain habitat into the future, while some of the older projects are providing browse today.

Aspen is relatively rare on the landscape and a need exists to maintain or enhance the forest type. Existing clones can be maintained by removing competing vegetation for goshawks and migratory birds. Aspen can also be enhanced and maintained for a longer time period by regenerating the stand, which is also beneficial for moose browse.

## **National Direction**

### **National Fire Plan**

In 2000, the Secretaries of Agriculture and the Interior developed an interagency approach to respond to severe wildland fires, reduce their impacts on rural communities, and assure sufficient firefighting capacity in the future (USDA and USDI 2000). This report, known as the National Fire Plan (NFP), outlined a strategy to reduce wildland fire threats and restore forest ecosystem health in the interior West. In 2001, Congress funded the NFP to reduce hazardous fuels and restore forests and rangelands. In response, the Secretaries of Agriculture and the Interior, along with the Western Governors and other interested parties, developed a 10-year strategy and implementation plan for protecting communities and the environment (USDA and USDI 2001). This plan, coupled with the Federal Wildland Fire Management Policy (NIFC 2001), forms a framework of federal agencies, states, tribes, local governments, and communities to work together to reduce the threat of fire, improve the condition of the land, restore forest and rangeland health, and reduce wildland fire risk to communities.

### **Healthy Forest Initiative**

Former President George W. Bush proposed the Healthy Forest Initiative (HFI) in 2002 to reduce barriers to the timely removal of hazardous fuels. The HFI proposed to expedite administrative procedures for hazardous fuel reduction and ecosystem restoration projects on federal land.

### **Healthy Forests Restoration Act**

Sixteen months after HFI was introduced, Congress passed the Healthy Forests Restoration Act of 2003 (HFRA) (P.L. 108-148) to reduce delays and remove statutory barriers for projects on federal land that reduce hazardous fuels and improve forest health and vigor. HFRA also helps rural communities, states, tribes, and landowners restore healthy forest and rangeland conditions on state, tribal, and private lands.

Criteria for projects to be authorized under this act include fuel condition class, adjacency to communities at risk, and collaboration (Federal Register, January 4, 2001, Vol. 66, No. 3, p. 751-777).

The Bean North Vegetation Project is authorized under HFRA to reduce hazardous fuels within the established WUI designated by the Cooper Landing Community Wildfire Protection Plan completed July of 2006 (Kenai Peninsula Borough 2006).

HFRA requires that projects be developed in a collaborative manner. Collaboration has been ongoing throughout the planning process for the Bean North Vegetation Project, involving local landowners, interested parties, adjoining land management agencies, and those agencies with fire-fighting responsibilities in the project area.



## Background and Existing Conditions

The project area is located near Cooper Landing, Alaska in the Kenai Peninsula County near the Sterling Highway and state and private property. Bean and Juneau Creeks, just north of the Kenai River, run through the project area.

### Vegetation and Fuels

The forest in the project area is generally a mixture of species and age classes with varying degrees of overstory, midstory and understory foliage layers. Overstory trees are generally Lutz spruce (*Picea lutzii*) and black spruce (*Picea mariana*), with occasional patches of quaking aspen (*Populus tremuloides*), and individual isolated paper birch (*Betula papyrifera* var *kenaica*) or black cottonwood (*Populus balsamifera*). The midstory and understory consists mostly of paper birch, quaking aspen, Lutz spruce, black spruce, mountain hemlock (*Tsuga mertensiana*), and Scouler's willow (*Salix scouleriana*). Table 1 shows the approximate overall percentage of species composition within the project area based on common stand exam data. Throughout the project area, there is a mix of various vegetative types and layers: pure stands, mixed stands, mixed-aged stands, even-aged stands, browse and forage, muskeg and bogs.

**Table 1 Approximate Percentage of Tree Species Within the Bean North Project Area.**

Species	Percent
Lutz Spruce	33.0%
Black Spruce	29.9%
Mountain Hemlock	21.6%
Quaking Aspen	8.7%
Scouler's Willow	3.8%
Paper Birch	2.8%
Black Cottonwood	0.2%

The project area is relatively flat, generally ranging from zero to five percent slope, with an overall slightly southeast aspect. However, the slope within approximately 60 acres of the southeastern corner of the west unit exceeds 30 percent. The flatter portion of the project area is hummocky with frequent depressions and occasional small boggy areas. The west unit borders several large muskeg patches and a large muskeg patch, about 25 acres, lies within the center of the east unit.

Since the late 1980s, spruce bark beetles (*Dendroctonus rufipennis*) have impacted the Chugach National Forest in many locations, including the proposed project area. The bark beetle attack within the project area was not as severe an outbreak as other locations on the Kenai Peninsula. Many of the mature Lutz spruce trees were affected, but a significant number of mature Lutz spruce survived the infestation. Most of the larger (15 to 20 inch diameter) snags created from spruce bark beetle mortality have fallen to the ground. Fallen snags contribute to the accumulated tons per acre of downed dead woody material. When averaged throughout the entire project area, downed woody material accounts for about 18 tons per acre. Actual tons per acre in any given location vary widely. Some areas, like muskeg may have one ton per acre or less while other areas containing concentrations of fallen snags may have 40 to 50 tons per acre or more.

Some small patches of bluejoint reedgrass (*Calamagrostis canadensis*), a native grass, exist within the project boundaries, but it is currently not a fuel hazard within the project area. The dead grass can form thick mats of fine, flashy fuel which provides the potential for increased fire starts and rates of spread, and can contribute to intense fire behavior.

### **Fire History and Occurrence**

The settlement period of the area began in the late 1800's. Intentional and accidental fires were periodically set by miners and railroad workers. Potkin (1997) estimated that human actions accounted for over 99 percent of wildland fire ignitions on the Chugach National Forest from 1914 to 1997, with lightning caused fires occurring rarely. Most of these ignitions occur in Wildland Urban Interface (WUI) areas such as road corridors, campgrounds, and dispersed recreation sites.

### **Fire Regimes and Condition Class**

A fire regime is the generalized role fire plays in a given vegetative environment. It can be described by the fire conditions common within that regime such as fire frequency and regularity, seasonality, intensity, duration, and size.

Condition classes describe the degree of departure from historic fire regimes due to alterations of species composition, structural stage, and stocking level within an ecosystem. Schmidt et al. (2002) reported that one or more human-caused or natural events such as fire exclusion, insects and disease, and past management activities can alter the condition class of a given area and cause a departure from historic fire regimes.

The three condition classes are:

- Condition Class 1: The risk of losing key ecosystem components is low. Fire regimes are within an historical range. Vegetation attributes (species composition and structure) are intact and functioning within a historical range.
- Condition Class 2: The risk of losing key ecosystem components is moderate. Fire regimes have been moderately altered from their historical range. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased), resulting in moderate changes to one or more of the following: fire size, intensity and severity and landscape patterns. Vegetation attributes have been moderately altered from their historic range.
- Condition Class 3: The risk of losing key ecosystem components is high. Fire regimes have been significantly altered from their historical range. Fire frequencies have departed from historic frequencies by multiple return intervals, resulting in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Species composition and structure have been substantially altered from their historical range at patch and landscape scales. Insect and disease populations have been altered from their historic range.

Spruce/hemlock is the general forest type in the Cooper Landing area with areas of interspersed hardwoods. The historic fire regime for spruce forest types is generally characterized as high intensity and stand replacing. Coniferous forest types in the Kenai Peninsula tend to be associated with long interval, stand replacing fires (Potkin 1997). Forest types on the Seward Ranger District that contain at least 50 percent spruce are considered to be in Condition Class 3, because of the recent spruce beetle epidemic and the potential to rapidly change the historic norm. The Bean North project area falls within Condition Class 3.

## **Wildlife Habitat**

The project area has experienced wildlife habitat loss and declining forage as a result of spruce bark beetle impacts. Because of these impacts there is a need to promote habitat diversity for wildlife. This would include maintaining or enhancing late seral conifers and hardwoods for northern goshawks and migratory birds and promoting early seral hardwood browse and berries for moose and bear. This project would tie into previous projects that helped to promote moose and bear forage in the Juneau Creek drainage.

## **Recreational Values**

The Resurrection Pass National Recreation Trail and the Bean Creek Trail pass through the project area. Juneau Falls, a popular recreation destination, is located between the two units making up the project area. This project would help sustain recreational values with the reduction in fuel load and reduction in the chances of wildfire. The recreation experience within the project area includes a naturally appearing landscape and recreation opportunities that include mostly non-motorized activities. This landscape setting may be altered by a large-scale wildfire. Reducing fuels while maintaining visual integrity along Resurrection and Bean Trails would help enhance or maintain recreational values within the project area.

## **Proposed Action**

The Proposed Action includes treating approximately 705 acres of NFS lands near Cooper Landing, AK. Specific actions proposed include the removal of dead downed, dead standing, dying and unhealthy trees, thinning of trees adjacent to the trail system and potential sources of ignition, and piling and burning of residual slash to reduce existing fuel loads. Other treatments including improvement of existing vegetation and wildlife habitat through 212 acres of patch cuts to create early seral hardwoods, maintenance of aspen stands to remove competing vegetation, and hinge cutting of Scouler's willow.

Figure 1 in Chapter 2 shows the Bean North Vegetation Project treatment units. The map legend corresponds with Table 2 to show spatially specific actions or treatments prescribed for both units.

## **Forest Plan Direction**

The Chugach National Forest Revised Land and Resource Management Plan (2002) (Forest Plan) provides guidance for all resource management activities on the national forest. The Forest Plan uses Management Area (MA) prescriptions to provide direction for specific areas of the Forest. The MA prescriptions contain direction on the uses allowed, not allowed, or allowed subject to specific conditions.

The Bean North Vegetation Project proposes vegetation treatments in the Forest Plan MA 312 Fish, Wildlife, and Recreation Management Area, MA 244 Fish and Wildlife Conservation Area, and MA 210 Backcountry Management Area.

Fish, Wildlife and Recreation MA emphasize habitats for fish and wildlife species and year-round recreational opportunities in both developed and dispersed settings.

Fish and Wildlife Conservation Areas emphasize the conservation of specific fish and wildlife habitats. This management area prescription was developed to address the "Management of Fish and Wildlife Habitat" Interest and to provide options for addressing the "Habitat for Fish and Wildlife" Situation Statement.

Backcountry MA are managed to emphasize a variety of recreational opportunities for backcountry activities in natural appearing landscapes.

The proposed action for this project is consistent with these MA prescriptions.

## **Decision Framework**

The project's Responsible Official is Seward District Ranger, Travis Moseley. Given the purpose and need, the Responsible Official reviews the Proposed Action and the other alternatives in order to make the decision of where treatments will occur, when and how the treatments will be implemented, amount of acres to be treated, and the types of treatment to occur.

Copies of the project proposal may be obtained by writing or calling the Seward Ranger District office, 334 4th Avenue, P.O. Box 390, Seward, Alaska 99664, (907) 224-3374. Additional information may also be obtained from Amanda Mico at the Seward Ranger District.

## **Public Involvement**

Public involvement for the Bean North Vegetation Project has been conducted in accordance with the requirements set forth in HFRA at 36 CFR 104(e). The Forest listed the proposed action in the Schedule of Proposed Actions on July 1, 2009. The Forest conducted two public meetings in Cooper Landing on January 25, 2011 and April 26, 2011 to help craft the proposed action. Participants of the public meetings, as well as other parties showing interest through mailed comments, were given another opportunity to comment on the Proposed Action between June 15 and June 30, 2011.

## **Issues**

The Forest Service identified several issues raised during both internal and public scoping. These issues include:

- Protection of soil and water resources, especially in consideration of mechanized equipment use
- Protection of wildlife resources
- Protection of fisheries resources
- Controlling the introduction or spread of invasive plants
- Unauthorized access off of trails
- Firewood availability and accessibility for the public
- Smoke issue during the tourism season
- Future treatments to continue creating moose browse

Each of these issues will be addressed in the proposed action or with design criteria that control or modify how any actions are implemented.

## Chapter 2 – Alternatives

This chapter describes and compares the two alternatives considered for the Bean North Vegetation Project. It includes a description and a map of the proposed action. This section also presents the Proposed Action Alternative and the No Action Alternative in comparative form, sharply defining the differences between both alternatives and providing a clear basis for choice among options by the deciding official and the public.

### Alternatives

#### Alternative 1 – No Action

Under the No Action Alternative, current management plans would continue to guide management of the project area.

#### Alternative 2 – Proposed Action

The Proposed Action would improve fire protection and prevention, reduce hazardous fuels and improve vegetation and wildlife habitat on National Forest System (NFS) lands of the Chugach National Forest in the Cooper Landing Wildland Urban Interface (WUI). Specific actions proposed to meet the purpose and need include various combinations of treatments on about 705 acres of NFS lands near the community of Cooper Landing. Treatments include the removal of dead downed, dead standing, dying and unhealthy trees, thinning of trees adjacent to the trail system and potential sources of ignition, and piling and burning of residual slash to reduce existing fuel loads. Other treatments including improvement of existing vegetation and wildlife habitat through patch cuts to create early seral hardwoods, maintenance of aspen stands to remove competing vegetation, and hinge cutting of Scouler's willow.

The project area includes two treatment areas: the West area is 220 acres and the East area is 485 acres. Both units are planned for mechanical treatment which would require removal of vegetation for equipment access, maneuverability, and skid trails. The West unit would be accessed from existing skid trails off the Juneau Creek Road system. The East unit would be accessed from the Slaughter Ridge Road and existing skid trails. Project implementation may occur with the use of Stewardship contracts or agreements.

The map (Figure 1, page 8) shows the Bean North Vegetation Project treatment units and the map legend corresponds with the table that follows to show approximate locations of treatments and design criteria. Table 2 outlines specific actions or treatments prescribed for both units and the design criteria outlines environmental protection and other design developed during project planning and public involvement.

**Table 2 Proposed Action Descriptions**

<b>Treatment</b>	<b>Description</b>
Fuel Removal + Pile/Burn	Treatment of dead/dying standing trees and dead downed trees by piling and burning of the material. Treatment would increase probability of fire suppression by minimizing accumulation of surface fuels and reducing the probability of rapid fire spread near potential points of ignition.
Thin Within 100 Feet of Trails	Remove ladder fuels through thinning live trees within 100 feet of Resurrection Pass and Bean Creek trail while maintaining the natural appearance of vegetation. This would be accomplished through variable density thinning (VDT), an overall thinning of an area with small areas of removal, or "gaps," and areas of exclusion where no vegetation is cut, or "skips." The overall thinning would be from below, focusing on small diameter trees. Thinning would increase probability of fire suppression

Treatment	Description
	<p>along access points (trails) by removal of ladder fuels, reducing risk of torching and crown fire near trails, and by minimizing the growth of bluejoint reedgrass, a flashy fuel in dry conditions, following treatment. This treatment would also maintain or improve spruce stand vigor, reducing susceptibility to drought or future insect infestation.</p>
Patch Cuts ¼ up to 30 Acres	<p>Regenerate hardwoods through patch cuts on up to 30% of the project acreage to enhance moose browse: West: 66 acres; East 146 acres.</p> <ul style="list-style-type: none"> <li>• Transition conifer dominated stands to early seral birch and willow in a mosaic of patch sizes across the planning area by removing existing trees. Large patches would be long and narrow in order to provide nearby cover for moose. Some birch and willow would be retained in order to provide limited seed sources for regeneration.</li> <li>• Regenerate all or part of existing small clones of aspen that would otherwise be outcompeted by more shade tolerant species, such as spruce or hemlock, by removing aspen trees and other trees around the clone, allowing it to expand. Treatments will occur during winter dormancy to allow maximum reserves for prolific root and stump sprouting the following growing season. The entire clone should be harvested, including all stems greater than 1 inch diameter and 4.5 feet high, to ensure maximum release of root sprouts.</li> <li>• Enhance Scouler's willow by regenerating 25% of the mature trees throughout the project area through hinge cutting. Select healthy trees without rot to maximize sprouting from the stump and along the bole.</li> </ul>
Retain Mature Aspen	<p>Remove competing vegetation (spruce and hemlock) 50 to 100 feet in and around existing aspen clones in order to allow the clone to expand while leaving it intact for goshawk and migratory bird habitat. This method would allow some mature aspen clones to remain on the landscape.</p>
Minimize Bluejoint Reedgrass (Calamagrostis Canadensis)	<p>Pile and burn trees removed within patch cuts and/or pile trees and use mechanical site preparation, to expose mineral soil to create a seedbed for tree establishment and to limit competition of young trees with bluejoint reedgrass. Seed or plant with native birch and willow one year after harvest, following exposure of mineral soil, in order to take advantage of stored seed and reduce the lag time in which competing grass cover has time to monopolize sites. This treatment would reduce flashy fuels and competition for hardwood regeneration. For mechanical site preparation, 50-60% of the area will be scarified, removing the O-horizon from patches or strips without excessive displacement of the A- and B-horizon. Scarification should occur when soils are dry or frozen enough to support equipment without becoming compacted and when snow would not hamper success. Areas of aspen would regenerate naturally by root and stump sprouting.</p>
Provide Free Use Firewood	<p>Utilize mechanized equipment to bring material to a point where it can be accessed at the end of the Slaughter Ridge Road. Some improvements of Slaughter Ridge road and existing skid trails may be necessary, including clearing of a landing, brushing and resurfacing.</p>

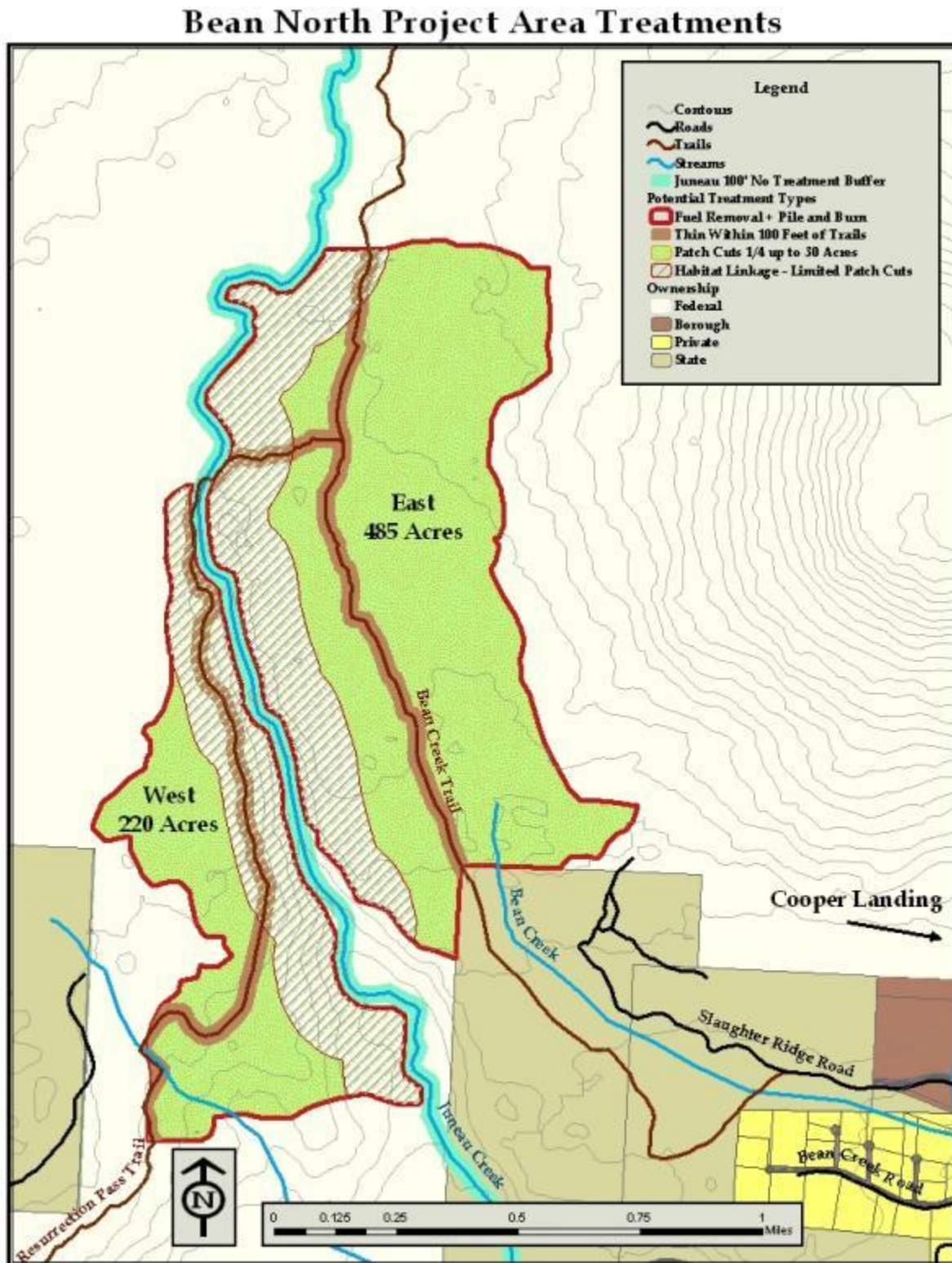


Figure 1 Bean North Vegetation Project Treatment Areas

## **Proposed Action Design Criteria and Monitoring**

The following design criteria are planned for the proposed action to reduce or eliminate potential adverse resource impacts as a result of the proposed vegetation improvements in the Bean North project area.

### **Wildlife**

- Follow Forest Plan guidelines for buffer zones around any new goshawk or bald eagle nests.
- Recommendation to conduct vegetation clearing operations outside the breeding season (May 1-July 15) of migratory birds.
- Exclude treatment of large diameter (36"+ DBH) hemlock.

### **Fisheries**

- Maintain 100-ft no-disturbance buffer along the project streams.
- Follow the Forest Service fishery standards and guidelines and all other applicable fishery protection guidelines (see fishery report)
- Management Indicator Species (MIS) will be monitored during project implementation to indicate the effects of management activities on adjacent fish and fish habitat.

### **Silviculture**

- Avoid wet areas when selecting locations for patch cuts in order to limit favorable sites for bluejoint reedgrass.
- Burn piles resulting from hazardous fuels treatments will be located in openings to protect residual trees from damage when the piles are burned.
- Maintain four snags per acre and at least 50 linear feet of larger (15-20 inch diameter) downed logs/surface material (Forest Plan 3-25).

### **Soil Resources**

- Avoid wetlands where possible and only operate mechanized equipment in wetland areas under frozen conditions.
- Only slopes up to 35% are considered suitable for mechanical operation. Streams will be identified during layout and avoided during operations.
- Do not place burn piles in streams or any other water body.
- The mechanized equipment work will be done when soils are dry (summer) or frozen (winter) to minimize rutting.
- Operate mechanized equipment on a slash mattress to avoid displacing or compacting soil. Slash can be tops, limbs, and sections of non-merchantable logs.
- Operate mechanized equipment on the contour of the slope and avoid running down the fall line. This prevents ruts that concentrate and move water and soil.
- Rehabilitate all mechanized equipment trails by:
  - Pulling berms back into the trail
  - "Fluffing" any slash pressed into the soil
  - Placing slash over any bared soil in the skid trail to prevent erosion
- If work is completed in summer, there may not be a need to scarify a site for birch regeneration.

### **Recreation Resources**

- Increase monitoring and enforcement during the first years after project implementation to help reduce illegal OHV access.
- Access for cutting firewood in the winter will be allowed consistent with motorized use restrictions in the Resurrection Pass area, or every other year.



## Visual Resources

- Establish a 50-foot buffer around Resurrection Pass and Bean Creek Trail to retain visual integrity: no limbing of trees, no slash piles, hand treatment only, and stumps should be 6" or less within the buffer. Mechanized equipment would be allowed to cross the trails only in designated areas. At these crossings, vary the width and edge shape to avoid a road look. Restore crossings to a natural appearance and repair trail tread as soon as they are no longer needed for implementation in order to lessen the visual impact.
- Slash piles will generally be burned within 1 year following implementation and efforts will be made to limit fire's spread from the slash piles in areas visible from the trail.
- Shape, blend and orient treatment units in a manner that is natural appearing and will not draw attention of an average forest visitor when the project is completed.

## Hydrology

- Applicable Best Management Practices (BMPs) should be followed during the proposed activities, as stated in the Region 10 Soil and Water Conservation Handbook (USDA Forest Service, Alaska Region, 2006).
- No treatments, burn piles, access roads, or skid trails should occur within 100 feet of Juneau Creek, Bean Creek, or the small Kenai River tributary in order to preserve the functional riparian zones around these streams and minimize erosion potential.
- Unmapped streams within the treatment area should be identified in the field during the summer months prior to any treatment, particularly prior to treatments that would occur in the winter when streams may not be visible. Access roads and skid trails should cross perpendicular to these streams in locations that would minimize stream bank impacts. Burn piles should be located at least 100 feet from any stream.
- To minimize potential impacts to wetlands, areas of mapped wetlands should be avoided during the proposed activities (see Best Management Practice 12.5). For mechanical treatments, if access roads, or skid trails are necessary in wetlands, then these activities should only occur during the winter with adequate snowpack and freezing temperatures. Hand treatments may occur in wetlands during the summer months.

## Plants/Non-Native Invasive Plants

- Avoid travel through patches of common dandelion (*Taraxacum officinale*) and/or invasive plants identified in the booklet "Selected Invasive Plants of Alaska," particularly when they have gone to seed to prevent their spread into new areas. Prior to entry onto National Forest, ensure all equipment engaged in vegetation clearing or ground disturbing activities have been cleaned/washed so they are free of visible dirt, plants, and plant parts. Take particular care to ensure undercarriages of vehicles are clean. In the event equipment is taken off site and then brought back, re-cleaning is only necessary if the equipment was used in another area with infestations of invasive plants.
- Some non-native species already occur on the Bean Creek Trail and Resurrection Pass South Trail. Stretches along those trails which are free of non-native species should be used as potential machine crossing locations to minimize the potential spread of these species.
- Use natural revegetation where seed source and site conditions are favorable towards achieving revegetation objectives. Use native plant species when natural revegetation conditions are not favorable (Forest Plan 3-25).
- If any previously undiscovered sensitive plants are encountered at any time prior to or during implementation of this project, protect the population and avoid any disturbance in the area containing the population (and similar habitats in that vicinity). The district or forest botanist/ecologist should be notified immediately to evaluate the population and recommend

avoidance or mitigation measures. The following sensitive species have the potential to occur in the project area:

- *Cypripedium guttatum*
- *Ligusticum caldera*
- *Papaver alboroseum*
- *Romanzoffia unalaschcensis*

### **Fuels and Fire Behavior**

- A prescribed burn plan will be developed and approved prior to initiating any burning operation.
- Piles will be burned after October 1<sup>st</sup> and during a time with southerly or easterly winds to mitigate smoke concerns in Cooper Landing and along the Sterling Highway.

### **Heritage Resources**

- The areas where mechanized equipment cross the Bean Creek Trail should be reviewed before implementation or monitored during implementation by the district archaeologist because it is eligible for the Register of Historic Places. No other cultural resources were identified within the project area.
- Post-project cultural resource survey will take place in any units with mechanical treatment and where the ground has been significantly disturbed or exposed.

### **Alternative Considered But Not Fully Developed**

#### **Ski Trails**

The concept of developing a system of formal or informal cross country ski trails in the vicinity of the Bean North project was recognized during the scoping process. However, the design and analysis of such a system has not been included in the Bean North Vegetation Project Proposed Action. For this project, the full development of a ski trail system is beyond the scope of this analysis. There are a number of considerations which would need to be assessed in the development of a comprehensive ski trail system including the connections to Borough and State lands, appropriate geographic location of a ski trail system on the landscape, how motorized travel would be managed on the trails, and how the trails would be constructed and maintained. The Bean North project area can be considered in selection of an appropriate location for trail systems on the landscape. These considerations and decisions would be made following an analysis specific to a ski trail system proposal.

#### **Free-use Firewood Access**

Several comments received during scoping requested access to firewood in winter via snowmachine, snowcat or pickup trucks. In addition, access was requested allowing the use of vegetation openings for mechanized equipment access after the snow has been packed down, and that these openings be planned strategically in consideration of use for ski trails. The Proposed Action provides opportunities for accessing firewood. In the winter, access would be allowed consistent with motorized use restrictions in the Resurrection Pass area, or every other year. Firewood would be expected to be made available utilizing mechanized equipment to bring a portion of the trees to a point where it can be accessed by the public.

#### **Temporary Road**

A temporary road was considered during project development to allow greater access for both free-use firewood and commercial removal of firewood. However, the concept was not fully developed because the purpose and need of the project does not focus on wood product removal. If firewood or other wood products are produced during implementation, these are a by-product of other project objectives, such as reduction of hazardous fuels and enhancement of wildlife habitat and vegetation. In addition, the cost of construction of a temporary road would likely outweigh the value of the product. The contract for this

project would determine the quantity of material that can be accessed and removed, allowing the creativity of contractors bidding on the project. Regardless of the contracting outcome, mechanized equipment would be utilized to bring a portion of the trees to a point where it can be accessed by the public.



## Chapter 3 - Environmental Consequences

This section summarizes the physical, biological, and social environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for the comparison of the Proposed Action and No Action Alternatives. A description of the affected environment is located within the resource reports (see project planning record).

Temporal and spatial bounds of the analyses as well as details of the analyses are contained in the specialist reports (see project planning record). Summary conclusions are excerpted here.

### Wildlife

#### Alternative 1 – No Action

##### Direct and Indirect Effects

Over time, fire risk may increase as more trees die from spruce bark beetle (*Dendroctonus rufipennis*) impact, increasing standing dead fuel, or fall to the ground increasing ground fuel. Human-caused fires may spread from the highway or community, which could destroy wildlife habitat in the short term, or change habitats to early seral communities. Some aspen stands are dying out, and would be replaced by spruce, reducing habitat diversity for a variety of species. However, this change would enhance habitat for spruce-dependent species.

##### Cumulative Effects

Cumulative effects include additional risk of wildfire in wildlife habitat for species that use mature or old growth conifer or mixed conifer/hardwood habitats. Fire risk has increased throughout the Seward Ranger District in areas where no action has been taken to reduce fuels or where access, cost, or topography makes fuel reduction infeasible. If a wildfire were to occur, this might affect individuals, but effects would likely be limited in space and time due to fire suppression. It is unlikely that the small scale of the affected area would impact populations of any species on the Chugach National Forest.

#### Alternative 2 – Proposed Action

##### Direct and Indirect Effects

Short term disturbance would occur during treatments from noise, people, machinery, chainsaws, or vehicles to most wildlife species. Habitat and effects for threatened, endangered, candidate, and sensitive species are analyzed in the Biological Assessment and Evaluation in Appendix B. Disturbance may cause habitat abandonment or avoidance. Heavy machinery may damage shrubs which are often important forage for moose. If work occurs during the breeding season, treatments may affect nesting birds using snags or live trees or shrubs if the nest substrate is cut, causing injury or death to nestlings. Heavy machinery may also destroy nests or young of ground nesting species.

Cutting of dead trees would reduce habitat for birds that nest, roost, or forage in or on snags. Over time, fire risk may increase as the remaining dead trees from spruce bark beetle infestation fall to the ground and ground fuel increases. Human caused fires spreading from the highway or community could destroy wildlife habitat in the short term and change habitats to early seral communities. Treatments would reduce this risk, helping to maintain important habitat components of mature vegetation and structure.

Vegetation treatments that thin sub-dominant trees and open the understory while maintaining the canopy closure should promote the growth of larger trees and promote conifer or mixed forests in the long term, rather than hardwood forests. This would benefit species that prefer mature or old growth conifer or mixed forests. Some patches of early seral birch and aspen may result in

selected areas which would help maintain these species in the units over time as well, promoting habitat diversity. Small patches of hardwood re-generation may provide some moose browse but are unlikely to attract new moose to the area. Treatments maintaining or enhancing nonbrowse plants, such as lowbush cranberry, would benefit moose, especially during winter months. Hardwood and shrub regeneration would provide browse for smaller herbivores such as snowshoe hares (*Lepus americanus*).

### **Cumulative Effects**

When combined with past, present and reasonably foreseeable future actions (see wildlife report), the project would cause short term cumulative impacts to MIS (Management Indicator Species), SSI (Species of Special Interest), and migratory birds and their habitats due to vegetation removal and disturbance from project activities in conjunction with other past, present, and reasonably foreseeable activities. Project actions would also contribute to beneficial cumulative effects of reduced wildfire risk to habitats. Although this would affect individuals, effects would be limited in space and time. It is unlikely that the small scale of the operation would impact populations of any species on the Chugach National Forest.

## **Fisheries**

### **Alternative 1 – No Action**

#### **Direct and Indirect Effects**

No direct effects are expected.

The spruce beetle infestation is reaching the end its trajectory. As dead standing trees fall they become coarse woody debris that is an important component of stream ecosystems. This coarse woody debris is also ground fuel that can carry fire. Lightning or human-caused fire through the project area would increase the sediment load to the perennial streams which may have a short-term effect on stream habitat concomitant invertebrate and fish populations within the project area and downstream. With increased time on the ground these fuels decay and become less likely to be a significant fuel component.

#### **Cumulative Effects**

Cumulative effects include additional risk of wildfire and the effect on the stream ecosystems. Fire risk has increased throughout the Seward Ranger District in areas where no action has been taken to reduce fuels or where access, cost, or topography makes fuel reduction infeasible. If a wildfire were to occur, this might affect stream habitat and associated invertebrate and fish populations, but effects would be relative to the extent and degree of fire suppression actions. Depending on these actions, sediment load may impact downstream populations and redds. It is unlikely that the small scale of the affected area would greatly impact populations of any aquatic species in the long term.

### **Alternative 2 – Proposed Action**

#### **Direct and Indirect Effects**

There are no foreseen effects from the proposed action alternative to salmon species or resident fish species with the proper implementation of 100-foot stream buffers and proper application of applicable Water Quality standards and guidelines and Best Management Practices.

## **Cumulative Effects**

No threatened, endangered, or sensitive species are known to occur in or immediately adjacent to this project area. No cumulative effects are expected from this project.

## **Silviculture**

### **Alternative 1 – No Action**

#### **Direct and Indirect Effects**

The untreated forest would change over time under the influence of natural processes such as fire, weather, disease, and insects. Ager's (2000) pollen research suggests that conifers have expanded their frequency over the past 2500 years and this seems a reasonable outcome of the no action alternative. Lutz spruce, black spruce and mountain hemlock would become more prevalent as young trees mature and begin to dominate hardwood species such as paper birch and quaking aspen. Pockets of decadent quaking aspen would likely become stands of Lutz spruce. In time a thicker, even-aged spruce forest would predominate, reducing the currently existing mosaic of vegetation types.

The continued accumulation of fuels would contribute to more intense, longer duration fires.

Berg and Anderson (2006) found that stand replacing fire cycles for spruce were about 600 years; the cycle for stand replacing spruce beetle outbreaks was about 50 years. The spruce beetle prefers even aged stands of spruce (USDA-FS, 2001). Therefore, even-aged forests could be more susceptible to both stand replacing fires and spruce beetle outbreaks. Landscapes with a variety of vegetative types and vegetative structures tend to hinder large scale stand replacing events.

#### **Cumulative Effect**

No action on the existing vegetation could increase the risk of wildfire and could increase the intensity of potential fires. Fire risk has increased throughout the Seward Ranger district in areas where no action has been taken to reduce fuels or where access, cost or topography makes fuel reduction infeasible. If a wildfire were to occur, this may affect individuals, but effects would likely be limited in space and time due to fire suppression. It is unlikely that the small scale of the affected area would impact overall populations of any tree species on the Chugach National Forest.

### **Alternative 2 – Proposed Action**

#### **Direct and Indirect Effects**

Thinning from below would reduce competition for residual trees promoting their growth. It can also promote stand health by removing stunted trees and those that have been damaged by animals and disease. Utilizing variable density thinning of the smaller (7 inch and smaller dbh and less than 20 feet tall) trees would reduce ladder fuels

Opening the forest floor via patch cuts or thinning may promote *Calamagrostis* growth. *Calamagrostis* can form dense covering and create a thick mat of fine fuels when it cures. Also, thick mats of *Calamagrostis* deter seedling propagation and growth. Opening the forest floor to more sunlight via patch cuts may promote *Calamagrostis* growth, but the promoted hardwood regeneration would help mitigate this. Thinning should not enhance the grass and mechanical treatment during frozen conditions or dry conditions in the summer should mitigate soil exposure.

Mechanical operations are planned during frozen conditions or dry conditions in the summer and should not impact the ground cover layer. Hand operations would occur during the summer months but these should not impact the ground cover layer. Removing more of the larger standing dead would not have a detrimental effect on the vegetation. The proposed action would have minimal effect on current spruce bark beetle populations. The recent outbreak of the 1980s has run its course in this area. Spruce beetles prefer to brood in windthrown trees (USDA-FS, 2001) and the current downfall is not suitable for beetle broods. Slash created by treatments would be processed and the slash piles would be burned, so the proposed action would not promote spruce beetle populations.

Removing deformed and dying spruce while retaining healthier trees would enhance the overall health of the spruce population.

### **Cumulative Effect**

In the 1990s through 2007 several locations near the project area were vegetatively treated; they have regenerated with paper birch (Kenai variety), willow, and aspen as well as conifer species and provide a beneficial contribution to landscape diversity. There are no other active harvests or treatments being conducted in the immediate project area.

Several past wildland fires have also occurred in the general area. The influx of tourism from nearby Cooper Landing and recreation use in the area could increase the risk of fire starts both within and outside the project area. People gathering firewood and other forest products could increase the risk of fire starts. These practices would also have some effect on the overall vegetation, but this would be minimal and very local and not contribute adversely to overall cumulative effects.

## **Soil Resources**

### **Alternative 1 – No Action**

#### **Direct and Indirect Effects**

There are no direct or indirect effects from the No action Alternative for the soil resources

#### **Cumulative Effects**

There are no cumulative effects from the No Action alternative.

### **Alternative 2 – Proposed Action**

Detrimental disturbance from mechanical piling and burning, mostly as displacement, soil burning and erosion, is estimated at 5 percent (Foss, 2011). These results are from monitoring of similar treatments in Hope, AK when all work was completed over snow or frozen ground. Operating on dry soils and utilizing a slash mat would minimize detrimental soil disturbance. All units are expected to meet the 15 percent detrimental soil disturbance threshold (USFS, 2006).

The natural erosion rates are currently low owing to the thick organic mat protecting the mineral soil. Baring any of the mineral soil, even on a gentle slope can increase erosion. It is important to slash and seed any barred mineral soil or minimize any erosion.

#### **Site Scarification for Birch Regeneration**

When scarifying a site there is a risk of damaging the soil by displacing the nutrient-rich topsoil. If Birch is treated in the winter, an additional entry would be required to scarify the site when the soil is not covered with snow, thereby increasing the risk of soil disturbance. If the stand were



treated during the summer, the disturbance from yarding operations may be adequate to scarify the site without an additional entry.

### **Level of Effects to Soil Productivity**

Level of effects to long-term soil productivity varies by treatment (see soils report). Generally hand treatments or full suspension treatments have a relatively minor impact to soil productivity. Heavy mechanical treatments have the highest risk of exceeding soil quality standards and impairing long-term soil productivity by compacting soils in skid trails, tearing or displacing large areas, or leaving areas exposed to excessive soil erosion.

### **Cumulative Effects**

Cumulative effects for soils only occur if activities occur on the same piece of ground or treatment areas. Since there is very little past management and nothing planned in the future, the cumulative effects are the same as the direct effects for the proposed action alternative.

## **Recreation Resources**

### **Alternative 1 – No Action**

#### **Direct and Indirect Effects**

Under the No Action alternative, available recreation opportunities would remain the same in the project area including hiking, biking, snowmachining, site seeing, and backcountry camping. The majority of the project area lies within the Resurrection Roadless Area. The roadless character would not be affected by the No Action alternative. This alternative does not propose any road building or timber cutting, two activities which are limited to specific circumstances within a roadless area.

The entire project area is located in a Semi-Primitive Non-Motorized Recreation Opportunity Setting (ROS) class. The No Action alternative would not change the ROS class since no activities would be planned.

#### **Cumulative Impacts**

The No Action alternative in combination with past, present and reasonably foreseeable future actions would only impact recreation resources during the short term. These cumulative impacts would not change the overall recreation resource opportunities in the project area.

### **Alternative 2 – Proposed Action**

#### **Direct and Indirect Effects**

Under the proposed alternative, the recreation opportunities would be affected by the following short term impacts. During implementation of the project, use along the Resurrection Pass and Bean Creek Trails would be affected by crossing mechanized equipment and during implementation of hand treatments. Mechanized equipment would affect trail use which would delay use of the Trails or limit use when machinery crossed trails. Hand treatments would not affect recreation opportunities because personnel and equipment would be located off of trails.

The burning of piles would slightly impact users near the trails and in the backcountry campsite during implementation. Though burn piles would not be located within 50 feet of the Trails, smoke may affect the recreation experience. While the effects from smoke are not expected to be long-lived, it would affect users at varying degrees depending on existing air conditions. Burning of piles would occur after October 1 and the burn plan would take these conditions into account to minimize effects to users.

Short-term negative impacts of removing dead and dying trees along the trails would include possible illegal OHV access off of the trails on skid and access routes and increased noise from mechanized equipment. Increased monitoring and enforcement until skid and access routes have regenerated would help reduce illegal OHV access.

The Proposed Action alternative would not affect the ROS class of Semi-Primitive Non-Motorized in the project area because no roads would be built. There would be no change to the semi-primitive nature of the area except during implementation of the project, which would only occur during implementation of the project.

The majority of the project area is located within the Resurrection Roadless Area. No roads are proposed to be built under the Proposed Action alternative. The cutting of generally small diameter timber is proposed which is an acceptable activity within a roadless area because it would improve roadless area characteristics. The cutting of small diameter timber would improve the characteristics of ecosystem composition and structure. In this case, it would reduce the risk of uncharacteristic wildfire effects.

### **Cumulative Impacts**

The Proposed Action alternative in combination with the past, present, and reasonably foreseeable future actions would cause minor overall impacts to the recreation resources. These impacts would be short term including delaying use along the Trails while the project is being implemented along with delays associated with routine trail maintenance. Delays would be short and not prevent users from accessing the Trails. The affects of smoke from burn piles would also be short term during project implementation. These impacts would not change the overall recreation resources available within the project area.

## **Visual Resources**

### **Alternative 1 – No Action**

#### **Direct/Indirect Effects**

Under the No Action alternative there would be no thinning in the project area. Competition for resources would continue to increase, causing opportunities for insects and disease and dead and dying trees. An increased fuel load would increase the likelihood of wildfires, which would leave burned vegetation. Most people do not enjoy viewing the scars from fires. The No Action alternative would encourage the continued succession of spruce as a dominant species. This type of similar vegetation has less aesthetic value for the forest.

Fuels would continue to increase thereby increasing the chance of hotter and more destructive fires; however the SIO would continue to be High or fairly High until the area burns. After a high intensity fire occurs, a more monoculture type forest would regenerate causing a lush looking forest. Over time, a mostly mature tree forest would contain few if any young or middle age trees. Fewer open areas would decrease the view shed opportunities for visitors to the project area.

#### **Cumulative Effects**

In combination with the past, present and reasonably foreseeable future action, the No Action alternative increases the potential for a devastating fire. Camping and campfires become more of the fire threat due to the close proximity of trees and vegetation to the camping areas. The combination of thick forest with dead or dying trees plus the adjacent private property and recreation can also increase the chances of wildfire ignition. Lush vegetation usually causes a

more intense fire that takes longer for the forest to revegetate. Most people prefer a lush looking forest. The scenic value of the monoculture forest is not as great as within a forest with open space or meadows. Most forest viewing is done from the forest edge. Monoculture forests have limited viewing potential. Though not typically visually pleasing in the short term, forest diversity created after a fire breaks up the view shed and adds visual interest. Managing the forest for more diverse ecosystem adds to the scenic quality by providing variety and contrast, as well as, increased wildlife viewing.

## **Alternative 2 – Proposed Action**

### **Direct and Indirect Effects**

The Proposed Action includes actively managing the forest which would create some short term scenic degradation from the view shed within the project area. After the first year or two it would be extremely difficult to distinguish where the forest had been thinned, and within five years it would appear lush and treatments would appear almost nonexistent. In combination with the visual design criteria, the proposed action would increase plant diversity which adds to scenic value. It would also improve wildlife viewing opportunities by creating open viewsheds.

Scenic Integrity Objective (SIO) acreage within a LRMP area may be changed up to 20 percent without amending or revising the Forest Plan. The Bean project would impact each LRMP area by less than 20 percent. In no case would the scenic integrity exceed the level of the lowest acceptable SIO for respective LRMP area. Negative scenic impact would be temporary but these visual impacts would lessen each year after implementation and would be virtually undetected after the first year or two.

Bean North and Resurrection Pass Trails have a 50 foot buffer design criteria proposed for each side of the trails. This buffer would help keep the forest visitor from viewing the most heavily treated areas within the project area. The first 300 feet of treated areas would have the most negative visual impact on the visitor, which would mostly be from the trails in the project area. Over time this visual impact would decrease while vegetation grew back. The highest impact visually would be immediately after implementing thinning along the trails. After the first year or two it would be difficult to identify any negative impact caused from thinning and vegetation management. Within five years vegetation would grow back and it would appear pristine, thus maintaining the High SIO for the majority of the project area.

### **Cumulative Effects**

In combination with the past, present, and reasonably foreseeable future action, the proposed action would meet the scenic objectives outlined in the Chugach National Forest Plan. Implantation of this proposed action does not affect more than 20 percent of the LRMP areas of the forest that would be impacted. Thinning of these areas would be most evident during the first year after implementation.

The nature of the forest view shed would change slightly, but within a year the effects would be minimal, and within five years the forest would begin recover so it will begin to appear more natural.

Hardwood stands would be modified to provide moose habitat. One goal is to establish new stands of paper birch, willow and aspen, which will create a more diverse forest that is naturally a higher scenic value. .

## **Hydrology**

### **Alternative 1 – No Action**

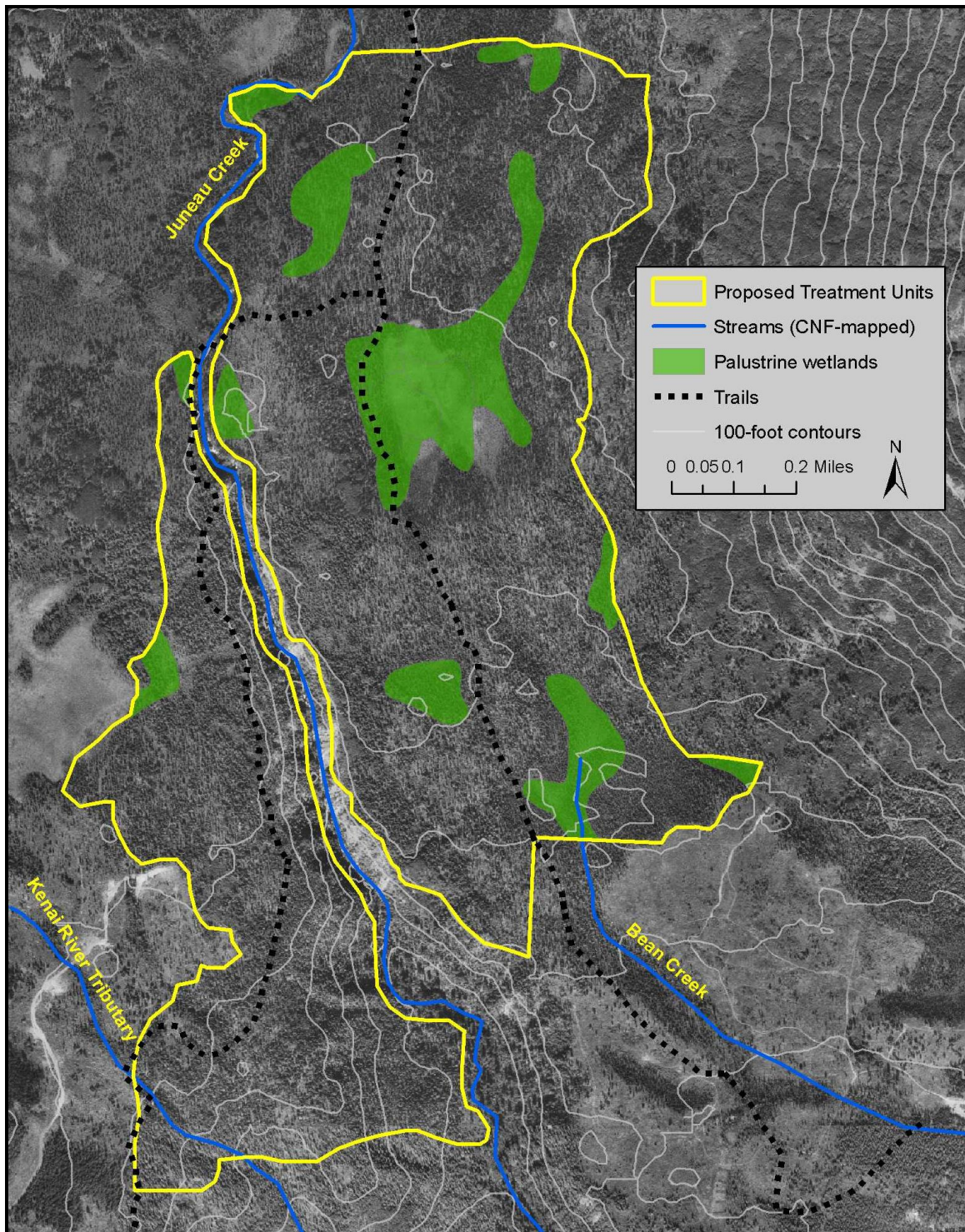
#### **Direct and Indirect Effects**

The No Action Alternative would result in no change from the existing condition. Because no treatments would occur, no direct effects would occur to stream channels, streamflows, water quality, floodplains, or wetlands. Indirect effects to water resources could occur as a result of increased risk of wildfire from not treating fuel loading related to continued spruce bark beetle impacts. If it were to occur, catastrophic wildfire could result in considerable changes to stream channel morphology, flow regimes, erosion and sedimentation, and riparian health in the short term.

### **Alternative 2 – Proposed Action**

#### **Direct and Indirect Effects**

The proposed treatments would have little or no direct or indirect effects on stream channel processes, bank stability, or riparian condition. Treatments would not occur within 100 feet of mapped streams, and Best Management Practices would be followed to protect riparian zones and maintain bank protection, habitat conditions, and recruitment of woody debris (Figure 2). Wetland design criteria would ensure that impacts to unmapped streams are minimized.



**Figure 2 Mapped Wetlands Within the Project Area**

The proposed treatments would have little or no direct or indirect effects on streamflows within or downstream of the project area. The removal of primarily dead and dying spruce would have little effect on evapotranspiration rates. Patch cuts for habitat improvement would not remove the



understory and would have little effect on rates of evapotranspiration or surface runoff. The proposed treatments would result in minimal exposure of bare ground, and understory regrowth would occur quickly in these areas, minimizing any effects on runoff. The Proposed Action would decrease the risk of wildfire, minimizing potential changes in flow regime that could occur because of increased runoff in burned areas.

The proposed treatments would have little or no direct or indirect effects on water quality in streams in the area. Because most of the proposed project area is located on a relatively flat bench, the risk of surface erosion and mass wasting is low. Sediment from surface erosion would be minimal because of the limited amount of ground disturbance and the fast rate of understory regrowth. Wetland design criteria ensure that sensitive areas such as wetlands and streambanks are minimally impacted. The Proposed Action would decrease the risk of wildfire, minimizing the potential for sedimentation that could occur as a result of loss of ground cover in burned areas.

The proposed treatments would have little or no direct or indirect effects on floodplains and wetlands. Treatment would not occur within the few areas of floodplains that are located within the project area, because treatments would not occur within 100 feet of mapped streams (see design criteria). Mechanical treatment activities within areas of mapped wetlands would only occur during the winter to minimize any impacts to wetlands (see design criteria). Hand treatment would have minimal impacts to wetland areas. The Proposed Action meets the intent of Executive Order 11988 for floodplain management and Executive Order 11990 for protection of wetlands.

### **Cumulative Effects**

The cumulative effects of this project and other activities occurring in this area would have minimal impact on water resources. This project would improve the forest health, and this project would help to improve the condition of the forest along Juneau Creek and Bean Creek in the short term and the long term. Although numerous hazardous fuel treatment projects have been conducted in the Cooper Landing WUI watersheds, understory regrowth occurs quickly, and the effects on evapotranspiration, erosion, and surface runoff are minimal. Other activities occurring along Bean Creek and Juneau Creek in this area have limited impacts. Recreational impacts to streambanks are localized in the Juneau Falls area, and the Juneau Falls area is withdrawn from mineral entry. Few impacts occur upstream of the project area in the Juneau Creek watershed, as this is a backcountry area with a variety of low impact recreational uses.

## **Plants**

### **Alternative 1 – No Action**

#### **Direct and Indirect Effects**

An untreated forest would change over time under the influence of natural processes such as fire, weather, disease, and insects. Ager's (2000) pollen research suggests that conifers have expanded their frequency over the past 2500 years and this seems a reasonable outcome of the no action alternative. Lutz spruce, black spruce and mountain hemlock would become more prevalent as young trees mature and broadleaf species such as Kenai birch and quaking aspen would become less prevalent. In time an even-aged spruce forest would predominate, reducing the currently existing mosaic of vegetation types.

This could alter the forest floor plant habitat within the 705 acres of the proposed project. However, this would not have a measurable effect on the nearly one million acres of potential habitat on the Kenai portion of the Chugach National Forest.

### Cumulative Effects

If the no action alternative is adopted past, current and reasonably foreseeable future activities (see project planning record) could individually have a minor effect on vegetation and could cumulatively have a minor effect on vegetation. Previous vegetative treatment sites in the general area have regenerated with Kenai birch, willow, and aspen providing a beneficial contribution to landscape diversity and animal browse. The increase in habitat diversity and browse in the surrounding areas would have a minor effect on the project area due to increased animal use, but there is no evidence of overpopulation. Ongoing construction and landscaping in Cooper Landing would only have minor cumulative effect to native plants in the project area. These activities could establish non-native plant populations which could potentially be transported to the project area. This could be unintentional or intentional (planting non-native species as landscaping or erosion control) and could establish undesirable populations of non-native plants. The spread of existing non-native plants in the project area or introduction of new non-native species due to project implementation, trail work or trail users could have a negative influence on the native vegetation.

### Alternative 2 – Proposed Action

#### Direct and Indirect Effects

No sensitive species were found within the project area. However, care should be taken to minimize habitat damage.

Thinning from below would reduce competition for residual trees promoting their growth. It could also promote stand health by removing stunted trees and those damaged by animals and disease.

Opening the forest floor to more sunlight may promote *Calamagrostis* growth. *Calamagrostis* could form a dense covering and can create a thick mat of fine material when cured. This could deter seedling propagation and growth and crowd out other forbs and plants.

Cypripedium species are found in both open and closed forest habitats. *Cypripedium guttatum* (Spotted Lady's slipper) is suspected to exist on the Seward Ranger District. Although not found in the project area, opening the forest canopy would not be detrimental to the species if it exists here. Habitat preferred by *Papaver alboroseum* or *Aphragmus eschscholtzianus* is not found in the project area. Both are known to occur on the Seward Ranger District though not discovered in the project area. *Papaver* could benefit from opening the forest canopy by taking advantage of soil disturbance (Charnon 2007). It is unlikely that *Aphragmus* would be found in the valley bottom habitat of the project area.

Mechanical operations planned for winter months would not adversely impact the vegetative ground cover. However, some soil disturbance would be expected with planned patch cuts to promote hardwood regeneration. Mechanical operations occurring over dry ground during summer months would produce more potential soil disturbance. Soil disturbance could have a detrimental effect on spotted lady's slipper and other *Cypripedium* species suspected on the Chugach National Forest (personal communication DeVelice 2011). The only known population of spotted lady's slipper on the Chugach National Forest was destroyed with the creation of a gravel pit (USDAFS 2009). (*Cypripedium montanum*, suspected to occur on the Chugach National Forest, though not found in the project area, prefers undisturbed sites with at least 60% canopy cover (Seever and Lang 1998 via BLM website 2011). Since no *Cypripedium* or other PTES species were discovered in the project area, summer operations should not be prohibited. Burning slash piles would also create microsites of exposed soil. Some soil disturbance could be

beneficial for the pale poppy as it is known to take advantage of human disturbance (Charnon 2007).

Hand operations occurring during the summer months would not adversely impact the vegetative ground cover or create soil disturbance.

### **Cumulative Effect**

Past, current and reasonably foreseeable future activities (see project planning record) could individually have a minor effect on vegetation and could cumulatively have a minor effect on vegetation. Previous vegetative treatment areas have regenerated with Kenai birch, willow, and aspen providing a beneficial contribution to landscape diversity. The cumulative effects of previous tread work on the Bean Creek Trail, future maintenance work on the trail system and work accomplished on private inholdings around Cooper Landing and along the Sterling Highway are not expected to have direct adverse effects on PTES plants. The spread of existing non-native plants in the project area or introduction of new non-native species due to trail work or trail users could have a negative influence on the native vegetation. Also new non-native plants could be introduced into the general area of Cooper Landing due to road work and work done on private inholdings. This could be unintentional or intentional (planting non-native species as landscaping or erosion control) and could establish undesirable populations of non-native plants.

## **Fuels and Fire Behavior**

### **Alternative 1 – No Action**

#### **Direct and Indirect Effects**

The untreated forest would change over time under the influence of natural processes such as fire, weather, disease, and insects. Ager's (2000) pollen research suggests that conifers have expanded their frequency over the past 2500 years and this seems a reasonable outcome of the no action alternative. Lutz spruce, black spruce and mountain hemlock would likely become more prevalent than hardwood species such as paper birch and quaking aspen. In time an even-aged, densely spaced spruce forest would predominate, reducing the currently existing mosaic of vegetation types. Even aged, densely spaced conifer stands may be more susceptible to larger fire events. Also, the continued accumulation of downed woody fuels would contribute to fires with longer duration.

Landscapes with a variety of vegetative types and vegetative structures tend to hinder large scale, stand replacing events. Hardwood stands can be effective fire buffers, retard large fire growth, and can reduce the likelihood of initial fire starts (Celebrating Wildflowers 2011). Geospatial analysis of wildfires within interior Alaska confirmed that hardwood stands tend to be an effective wildland fire barrier (AFES 2005). Therefore, it is also desirable to maintain and enhance aspen and birch stands within the project area.

Based on the 90<sup>th</sup> percentile weather data and overall slope of five percent, Table 3 shows predicted fire behavior for various fuel types under the existing conditions within the Bean North project area. Fuel conditions in the open aspen stands are represented by Fuel Model 9A Hardwood Litter. Fuel conditions in the spruce and hemlock stands are represented by Fuel Models 10A and 10B. Fuel conditions in the black spruce stands are represented by Fuel Model TU04. Fuel conditions in the dead down blowdown pockets are represented by Fuel Model 13 Medium Slash.



**Table 3 Estimated fire behavior for fuel models represented within the Bean North project area.**

Conditions	FBPS <sup>1</sup> Fuel Model	Flame Length (Feet)	Rate of Spread (chains/hour) <sup>2</sup>
Existing <i>Calamagrostis</i>	3A Tall Grass -Low	5.1	100.3
Existing Mature Aspen	9A Hardwood Litter -Low	2.6	8.9
Existing Condition	10A Timber - Low	4.5	8.5
Existing Condition	10B Timber - Medium	6.2	12.2
Existing Condition in Black Spruce	TU04 Dwarf Conifer	6.7	17.1
Existing Condition in blow down pockets	13 Medium Slash	10.2	14.0
Proposed Action	8 Closed Timber Litter	1.0	1.7
<sup>1</sup> : Fire Behavior Prediction System utilizes the 1982 fuel models (Rothermel 1972, Anderson 1982, Albini 1976) and the 2005 FBPS fuel models.			
<sup>2</sup> : One chain = 66 feet			

### Cumulative Effects

Several past harvest units were created near the project area. In the early 1990s the Bear Flats Fuels Reduction project (about 600 acres) occurred on the west side of Juneau Creek and the Bean Creek Fuels Reduction project (about 400 acres) occurred on the east side of Juneau Creek. In 2006 and 2007, the Seward Ranger District removed the codominant Lutz spruce creating nearly 128 acres of mature aspen to the northwest of the west unit. These past treatments contribute to the habitat diversity of the general project area.

Cooper Landing has a current population of about 400 people and has a large seasonal tourist influx. The Kenai Princess Wilderness Lodge opened in 1990 and the Resurrection Pass Trail is popular for recreation enthusiasts. The Kenai & Russian Rivers south of the project area are popular fishing locations. The Resurrection Pass South Trail and the Bean Creek Trail are both within the proposed Bean North Fuel Reduction Project boundaries allowing frequent human access. Nearly 4000 people used the Resurrection Pass South Trail in 2005 during the months of June-August (USDA-FS 2005 unpublished). Since 1970 there have been about a dozen human-caused fires within the environs of the project area. Most of these have been campfires. This influx of people could increase the risk of fire starts both within and outside the project area.

### Alternative 2 – Proposed Action

#### Direct and Indirect Effects

Thinning from below would reduce competition for residual trees promoting their growth. It can also promote stand health by removing stunted trees and those that have been damaged by animals and disease. The proposed action should help create vegetative conditions more conducive to future firefighting efforts. Thinning the smaller (5 inch and smaller dbh and less than 20 feet) trees near the trail system would reduce ladder fuels and reduce stand density. The current stocking level in denser stands is 1500-1800 trees per acre; the target stocking level is 700 to 750 trees per acre. Piling and burning slash and reducing pockets of accumulated downed dead woody material would reduce the overall fuel loading.

Fuel treatments can help produce forest structures and fuel characteristics that reduce the likelihood of wildfires causing large scale ecosystem changes. Fuel treatments can also help modify fire behavior sufficiently to promote more efficient wildfire suppression (Graham et al. 2004).

The proposed treatments could help create fuel conditions closer to Fuel Model 10A or Fuel Model 8 (Table 3). Fire behavior similar to Fuel Model 8 Closed Timber Litter is desired because flame lengths for fires occurring within this fuel model type are generally less than two feet which is a desirable condition for fire fighter safety. Fuel conditions similar to Fuel Model 8 do not occur within the Bean Project area. However, reducing downed woody fuel accumulations and performing the suggested vegetative treatments could help create fuel conditions closer to those of Fuel Model 8 within the treated areas.

Fuel modification actions similar to those of the proposed action have proven to be valuable assets to firefighters. Breaking up fuel continuity modifies the behavior of wildfires (Graham et al. 2004). Thinning would help break up the continuity of dense, even-aged stands in the project area. Extreme weather conditions can outweigh fuel modification efforts such as reducing fuel loads. However, reduced fuel loadings and breaking up fuel continuity are beneficial tools in wildfire management and suppression.

The Chugach Revised Land and Resource Management Plan (LRMP) prescribes retaining a minimum of four snags per acre. Depending on tree species and forest cover type, snag size ranges from 11 to 20 inches minimum diameter with a minimum height of 15 feet. The current stocking of appropriate snags in these size categories is near this level throughout the project area. Also, the larger spruce snags would be prone to wind-throw. Common stand exam data estimates about 62 trees per acre of older dead trees. However, many of these trees are too small to qualify as snags under the forest standards. So care must be taken to maintain the appropriate snag component; it is recommended that at least 6 appropriate snags per acre be retained to accommodate for future windthrow.

The LRMP also prescribes retaining a minimum of 30-50 linear feet of larger down logs per acre in the 10 to 20 inch diameter class. Currently about 18 tons per acre of downed woody material in all size classes exist in the overall project area. Of this, about 12.6 tons/acre are in the 3+ inch diameter rotten wood class and about 2.1 tons/acre in the 3+ inch diameter sound wood class. Much of the larger downed woody material is in a state of decay and not as desirable to firewood users. In pockets where concentrations of beetle killed spruce have fallen, the amount of downed woody material may be 45 to 50 tons per acre.

The proposed action would meet or exceed these forest standards. Appropriate retention levels of snags and downed woody material would also be based on specific needs such as wildlife.

There is no forest standard for retaining slash piles. Slash piles provide habitat for a variety of animals and even hiding cover for larger animals (Sullivan et al. 2006). Sullivan (et al. 2006) recommended retaining 10 percent of slash piles in areas of extensive timber harvest and cited Giles (1976) who suggested retaining 2 to 10 piles per 2.5 acres. Leaving intact slash piles, perhaps one or two slash piles per acre would not be detrimental to future firefighting efforts.

In the right conditions, *Calamagrostis* can form a thick mat of fine fuels when it cures, potentially increasing the risk of fire starts, creating a potential fire hazard, promote fire spread and potentially deterring seedling propagation and growth. Opening the forest floor to more sunlight via patch cuts may promote *Calamagrostis* growth, but the promoted hardwood regeneration would help mitigate this. Thinning should not enhance the grass and mechanical treatment during frozen conditions or dry conditions in the summer should mitigate soil exposure.

Mechanical operations are planned during frozen conditions or dry conditions in the summer and should not impact the ground cover layer. Hand operations would occur during the summer months but these should not impact the ground cover layer. Removing more of the larger standing

dead would not have a detrimental effect on the vegetation. The proposed action would have minimal effect on current spruce bark beetle populations. The recent outbreak of the 1980s has run its course in this area. Spruce beetles prefer to brood in windthrown trees (USDA-FS 2001) and the current downfall is not suitable for beetle broods. Since only smaller diameter trees would be thinned and the slash burned, the proposed action would not promote spruce beetle populations. Burning slash piles would create disturbed microsites suitable for seedling regeneration and other plant growth.

### **Smoke Management**

Pile burning produces less smoke than a wildland fire. For example, smoke modeling estimates show that a wildland fire under severe conditions would produce nearly four times higher emissions than pile burning and higher emissions would last about two days. Emissions estimates for the project area show pile burning would peak for about 8 hours and produce considerably less emissions than a severe wildland fire.

Pile burning (and chipping) of tops and limbs is proposed in the project area. A prescribed burn plan would be developed and approved prior to initiating any burning operation. Piles would be burned after October 1<sup>st</sup> and during a time with southerly or easterly winds to mitigate smoke concerns in Cooper Landing and along the Sterling Highway.

### **Cumulative Effect**

Other factors affecting the general area include minor tread work on the Bean Creek Trail on State Land which borders the east unit, home construction and land development on private inholdings about one mile to the southeast of the project area, and previous treatment areas. There are no other active harvests or treatments being conducted in the immediate project area.

The previous treatments mentioned earlier have regenerated with paper birch, willow, and aspen as well as conifer species and provide a beneficial contribution to the landscape diversity. Work done on the Bean Creek Trail and private in holdings is minor.

The U.S. Forest Service consulted the following individuals, Federal, State and local agencies, Tribes and non-Forest Service persons during the development of this EA:

### **Consistency with the Forest Plan and Other Relevant Laws**

The development of this EA is based on direction contained in the 2002 Chugach National Forest Revised Land Management Plan (Forest Plan), the National Forest Management Act (NFMA) and its implementing regulations (36 Code of Federal Regulations (CFR) 219), NEPA and its regulations (40 CFR 1500-1508), and the requirements of HFRA (36 CFR 104).

**Endangered Species Act** -Biological evaluations were completed for threatened, endangered, proposed, and sensitive plant and animal species. No threatened and endangered plant or animal species would be affected by any of the action alternatives.

**Bald Eagle Protection Act** -Management activities within bald eagle habitat would be in accordance to a Memorandum of Understanding between the Forest Service and the U.S. Fish and Wildlife Service. No bald eagle nests are known in the project area.

**ANILCA Section 810, Subsistence Evaluation and Finding** -There is no documented or reported subsistence use that would be restricted by any of the action alternatives. For this reason, none of the alternatives would result in a significant possibility of a significant restriction of subsistence use of wildlife, fish, or other foods.

**National Historic Preservation Act of 1966** -Section 106 of the National Historic Preservation Act requires that all federal undertakings follow the regulations found at 36 CFR §800 to identify and protect cultural resources that are within the project areas and which may be effected by projects. The Chugach National Forest has followed the procedures in the Second Ammended Programmatic Agreement among the USDA Forest Service, Alaska Region, the Advisory Council on Historic Preservation, and the Alaska State Historic Preservation Officer (SHPO) regarding management of the project area. A finding of "no historic properties affected" has been reached by the Forest Service and this report is included in the 2010 Programmatic Agreement Annual Report to the SHPO.

**Executive Order 12898** -Environmental Justice -Implementation of this project is not anticipated to cause disproportionate adverse human health or environmental effect to minority or low-income populations because the proposed activities are not expected to cause any affects to human health or result in meaningful adverse environmental consequences.

**Clean Air Act** -Any pile burning anticipated from the implementation of the Proposed Action would be of short duration and would not be expected to exceed State of Alaska ambient air quality standards (18 AAC 50).

**Executive Order 13112** -Invasive Species -Invasive species populations would have little potential to spread in the project area.

**Executive Order 11988 and 11990** - The Proposed Action meets the intent of Executive Order 11988 for floodplain management and Executive Order 11990 for protection of wetlands.

**Recreational Fisheries (E.O. 12962)** - Federal agencies are required, to the extent permitted by law and where practicable, and in cooperation with States and Tribes, to improve the quantity, function, sustainable productivity, and distribution of United States aquatic resources for increased recreational fishing opportunities (U.S., 1995). As required by this Order, I have evaluated the effects of this action on aquatic systems and recreational fisheries and documented those effects relative to the purpose of this order. This action is consistent with this order because it would not impact the public's ability to recreationally fish in this area.

**Magnuson-Stevens Fishery Conservation and Management Act** - This project is not expected to result in any adverse effects to fisheries habitat because it is a low intensity action and proper application of applicable Forestwide standards and guidelines and Best Management Practices (U.S., 1996). Following these protocols and practices would also ensure that there are no additional impacts to fish populations and habitat over time and therefore no negative cumulative effects.

## **Chapter 4 – Consultation and Coordination**

### **ID Team Members**

Dave Spildie, Fisheries/Wildlife Biologist, Recreation Solutions Enterprise Team

William McFarlane, Hydrology

April Heesacker, IDT Leader/NEPA Writer Editor/Recreation Resources, Recreation Solutions Enterprise Team

Miles Friend, Fuels/Fire Behavior/Silviculture/Plants, Recreation Solutions Enterprise Team

Bill Rowe, Visual Resources

Jacqueline Foss, Soil Resources

Louanne Atherley, Heritage Resources, Recreation Solutions Enterprise Team

### **Federal and State Officials and Agencies**

Alaska State Historic Preservation Office

Alaska Division of Forestry

Kenai Peninsula Borough

### **Tribes**

CIRI (Cook Inlet Region Inc.)

Kenaitze Indian Tribe



## Chapter 5 – References

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## **Appendix A, Glossary of Terms**

CFR – Code of Federal Regulations

CWPP – Community Wildfire Protection Plan

EA – Environmental Assessment

Forest – Chugach National Forest

HFI – Healthy Forest Initiative

HFRA – Healthy Forests Restoration Act

IDT – interdisciplinary team

MA – Management Area

MIS – management indicator species

NEPA – National Environmental Policy Act

NFP – National Fire Plan

NFS – National Forest System

ROS – Recreation Opportunity Spectrum

TES – Threatened and Endangered Species

USDA – United States Department of Agriculture

USDI – United States Department of the Interior

WUI – Wildland Urban Interface

## APPENDIX B: Biological Evaluation for Threatened, Endangered or Sensitive Species.

### CHUGACH NATIONAL FOREST - Biological Evaluation

Date: August 2011

**Project Name:** Bean North Hazardous Fuel Reduction Project

**District:** Seward Ranger District – Chugach National Forest

**Project Type:** Fuel reduction and wildlife habitat improvement

**Location:** Seward Ranger District – Cooper Landing

**Project Actions:** Remove dead down and dead standing trees. Thin sub-dominant and small trees.

**Vegetation/Habitat Type:** Understory re-initiation mixed forest of Lutz spruce, birch, aspen, and hemlock.

I. Prior Biological Evaluation				No	Yes
Prior Project BE: Wildlife	Date:			X	
II. Species and/or Habitat				No	Yes
2. Previous Species Observation				X	
3. Federally Listed Species Present				X	
4. Habitat For Federally Listed Species Present				X	
5. Sensitive Species Present				X	
6. Habitat For Sensitive Species Present					X
III. Analysis of Effects				No	Yes
1. Significant Habitat Alteration					X
2. Effects Outside Project Area				X	
3. Cumulative Effects on Listed Species or Habitat				X	
4. Cumulative Effects on Sensitive Species or Habitat				X	
IV. Determination of Effects				No	Yes
1. No Affect Threatened, Endangered, or Proposed Species					X
2. May Affect Threatened, Endangered, or Proposed Species				X	
3. May Affect Individual Sensitive Species				X	
4. May Affect Sensitive Species Population Viability				X	
V. Consultation Requirements				No	Yes
1. Formal Consultation Required				X	
2. Additional Informal Consultation Required				X	
<b>Based on the findings above and the size and effect of the proposed project, a detailed biological evaluation and further consultation are not required.</b>					
Prepared and Approved By	David Spildie			Date: 08-01-2011	